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Notes on the Agricultural Produce of Cornwall. By Sir C. LEMON, Bart., F.R.S., Vice President of the Statistical Society of London, &c.

[*Read before the Statistical Section of the British Association, 2nd August,* 1841.]

THE greater part of what follows was written more than a year ago; but I was suddenly stopped in my inquiry by a circumstance which I will now relate, and which left me with an entire failure of proof regarding the proposition which I had principally in view. This paper, therefore, was thrown aside; and it is only because I think that the few agricultural facts which I then collected, and have since added to, may be of use to those who hereafter wish to know something of the produce of the county of Cornwall at the present time, that I have determined again to put on paper the scanty gleanings which, under the circumstances, I have been able to collect.

Statistical collections are often of no value at the time when they are made, and the only fair way of determining their worth is to ask the question, "Had a similar account been written fifty years ago, would it have been of use to inquirers at the present day?" If the answer with respect to this paper is in the affirmative, I am content to confess that I am not able to carry out my argument to the whole extent which I intended. My original paper was undertaken with this view:—It occurred to me that as Cornwall is almost surrounded by the sea, a test of the progress of its agriculture might be obtained by a comparison of its population at different times, checked by the imports of grain and flour at each respective period. During the earlier periods, I knew that I must rely only on the accidental observations of those who wrote on the state of the county generally; but for later times, I expected to have the books of the Custom-house to refer to for certain evidence of the amount of our trade with foreign countries, and with those districts of England from which we have been in the habit of importing corn, and consequently of the extent to which the population of the county has been dependent on resources exterior to itself. It was no small disappointment to me to find, after I had advanced to that part of the inquiry, that the books of the Custom-house at Falmouth, the principal place of import, had been destroyed about fourteen years ago. It appears that orders were received from London for their destruction, after certain extracts had been made; and those extracts give no information on the points which I have in view. The subsequent time is too short to lead to any important conclusions; and, thus baffled, I can do no more than record what I know of the present time, and afford to those who follow me the means of making those comparisons which are out of my reach.

It is unnecessary to go very far back in search of records of Cornish agriculture, or to dwell very long on intermediate events, but a few passing notes, collected from the historians of the different times, may be acceptable. Down to the date of Frazer's "Agricultural Report of Cornwall," in 1794, these extracts seem to favour the opinion that at no time was the agriculture of the county very deficient or very redundant; but that it sustained, or nearly sustained, the population, and rarely left a surplus. Leland, in his Journey in the time of Henry the Eighth, says that Roseland "is metely fertyle in corne and grasse;" but, from his description of the rest of the county, the impression on his mind seems to have been that Cornwall was "more fertyle in tynne than corne." Camden's opinion may at first seem to favour the idea of a redundant produce, but he is corrected by Carew, to whose opinion I should give greater weight, because he lived in the county which he described, and had opportunities of observing the changes produced by the seasons and the vicissitudes of trade. Camden says, that "grain is produced in Cornwall in such plenty, that it does not only supply their own necessary uses, but Spain also yearly with vast quantities of corn." Carew in some measure qualifies this statement, and says, hypothetically, that "*had not* the embargo with Spain foreclosed this trade, Cornwall *was likely*, *in a few years*, to reap no little wealth by the same. And yet, whoever looketh into the endeavour which the Cornish husbandman is driven to use about his tillage, shall find the travail painful, the time tedious, and the expenses very chargeable." Carew speaks also of the extensive cultivation of barley as a new thing, affording a valuable resource to the poor in dear seasons; "for they were principally relieved, and the labourers also fed by the bread made thereof." From this statement I infer that, in abundant seasons, there was a surplus for exportation, which Camden assumed to be regular; and in scarce seasons a deficiency, to be supplied by barley. In average years, the growth probably supplied the inhabitants, and no more. The direct agency of price in procuring this adaptation can hardly be described in better words than Carew's own:—"When the price of corn faileth, men generally give over surplus tillage, and break no more ground than will serve to supply their own turn; wherethrough it falleth out, that an ill-kerned year, or saved harvest, soon emptieth their old store, and leaveth them in necessity to seek new relief from other places." Dearth and high prices of course follow, and, as a necessary consequence, increased cultivation.

Camden speaks of the great fertility of particular spots in the county, and gives Roseland as an example. He derives the name of this district from Ros, signifying in British "a heath." The etymology is of no importance, except as affording him occasion for a remark on the industry of the inhabitants, which had rendered the barren land fruitful. Polwhele, on the other hand (upon what authority I know not), says that Roseland had, from the remotest times, been highly cultivated. Norden, whose journey was probably made in 1584 (though he wrote much later), describes the county in these words:—"Corne there is in competent abundance, of all kinds; yet is the soyle of the country for the most part but meane, especially in the middle parte, a greate parte whereof is mountainous, moorish, and craggy; which being yet husbanded, as the country lately hath taken course, by burning their ground, and by soyling it with sea-sande, it becometh very profitable, especially for rye. The soyle also is very thin. The cattell in this countrye are not greate, their feedinge being but meane." Ogilby, whose itinerary was written in the reign of Charles II., describes the district of Roseland as sandy; but it was his business to look at roads, not country. At that time the high-road from Exeter to the Land's End ran through Roseland, and over King-Harry passage, which was then called "the King's High Ferry;" probably the two last words have, in course of time, run into one. Blome's "Britannia," (temp. Charles II.) contains this remark, that Cornwall "is more inclined to sterility than fertility; but the parts near the sea, by reason of the industrious husbandman manuring the ground with sand and oreweed taken from sea-shore, beareth good corn." *

A little later there appeared in the "Philosophical Transactions," a paper entitled 'Improvements in Cornwall with Sea-Sand,' by Dr. Samuel Coxe. This paper bears no date, but appears to have been written about the year 1691. The following passage exhibits the custom then in use of exhausting the land by repeated cropping:—"When this sand is brought home, it is spread on the ground intended for wheat; or usually in the first crop of four, whatever may be the grain. After four crops, 'tis our custom to leave our land to pasture for six or seven years before we till it again." Dr. Coxe says, that "This sea-sand is mostly carried on horseback, but in some places is fetched by wheels." He computes the whole expense of its land carriage at 32,000*l.* per year. About forty years later, Tonkin makes the following remarks on the agriculture of his time, showing that Cornish husbandry still presented the same features. After confirming Carew's account of the process of heating, burning, scoding, and sanding of coarse and furzy ground, but objecting to his estimate of 20*s.* an acre for the cost, saying that it amounted generally to 40*s.*, he proceeds to describe the course of cropping, and the long rest given afterwards:—"The tiller generally takes six crops out of the land so prepared, viz., one of wheat, then two of oats, then one more of wheat, and two more of oats; or sometimes one of wheat, then one of oats, next one of wheat, and three of oats, according to the goodness of the land and the manure they put upon it; and then if it is kept up for inclosure, after four or five years it will be fit for tillage again. But if the land be but ordinary, and not worth the keeping up for inclosure, they let it run amain; and such will not answer the tilling anew under forty years or more." There is here no mention of barley; but in another place he speaks of the immense crops of barley grown in Meneage. Polwhele also speaks of that district as having from very early times been noted for its produce of barley. Tonkin mentions butts and wains, all drawn by oxen; but he says there were no carts or waggons, as being unsuited to the hilly and narrow ways. He refers to the scarcities in his time, when "very often the inhabitants do soon cry out on the least pinch."

Borlase, who wrote in 1756, says, that at that time the manure used came chiefly from the sea, and he regrets that marl was not more sought after. We have in Borlase the first mention which I have been able to find of the culture of turnips. His expression is:—"Of late the turnip husbandry has begun to obtain, and several gentlemen have experienced the benefit of this useful root, in feeding sheep and other cattle, and mellowing the land for corn. The potato is still a more useful root, now everywhere cultivated." After quoting Camden's observations, that Cornwall produced corn, "not only to supply the necessary uses of the inhabitants, but Spain also, with vast quantities of corn," he proceeds:—"The inhabitants, since Camden's time, are more advanced in number than the tillage has increased in proportion; and though the low lands in Cornwall, especially along the Tamar and Alan, may yield more corn than the inhabitants of those parts, and the less fruitful hundreds of Stratton and Lesnewyth, can dispense with; yet the hundreds of Powder, Kerrier, and Penwith, and the western parts of Pydre, do not yield corn near sufficient to supply the inhabitants. Upon the whole, if those parts entirely addicted to husbandry will yield a sufficiency of grain to make up, in a moderate year, what is wanting in the parts less cultivated and more addicted to mining, this is full as much as can be asserted in this particular."* These accounts also agree in representing the gross produce of the county, in articles of food for man, as hardly equal to the wants of the inhabitants, but approaching near to an equality in ordinary seasons.

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* From the circumstances of so many of these writers having thought it worth while to remark on the use of sea-sand in Cornwall, and of there having been about this time a paper in the "Philosophical Transactions," written expressly to explain the mode of use and benefit of this manure, it would appear that there was something peculiar to Cornwall in the custom, which was not known in other maritime counties.

In 1794, Mr. Frazer was employed by the Board of Agriculture to make a survey of the county. His report contains the following sentences. I must, however, premise that Frazer's epoch is one of peculiar interest; for, it is the pivot on which turned the change which occurred when, from being a country generally exporting corn, England became one generally requiring an importation of corn to feed its inhabitants; 1792 being the last year when any considerable quantity of corn was exported. "The internal parts of the county have remained hitherto uncultivated, and present to the view immense tracks of uncultivated waste and undivided commons, entirely in a state of nature; and, excepting the mining districts, almost without inhabitants. Cultivation has proceeded but a short space from the sea. On the sea-shores and the valleys near the banks of the great rivers are the chief, and almost only, seats of cultivation. On the whole, Cornwall, populous as it is in the mining districts and along the sea-shore, yet, if agriculture was more attended to, there can be no doubt that it would supply subsistence to a much greater population than it possesses; and it is to be hoped that we shall soon hear no more of complaint of scarcity in a county where nature has done so much and man so little. It must be confessed, that either agriculture has decayed or the population has increased much beyond the advancement in the improvement of their lands. The management of the lands is uniform. Arable is sown with wheat, barley, or oats, as long as it will bear any; and then grass for eight or ten years, until the land is recovered and again capable of bearing corn. Very often it remains in furze or brambles for twenty-five or thirty years. Their chief dependence is on sea-sand. Carts are not used in Devon or Cornwall; every thing is carried on horses' backs: they cannot be induced to try any other mode of carriage. In some parts of the county turnips are introduced as a rotation crop, but the practice is not general. It is, in fact, only practised by gentlemen farmers and the superior class of yeomanry. They neither drill nor hoe them, so that frequently the couch grass entirely covers the plants. In Cornwall, as nearly as I can calculate, the proportions of waste and uncultivated land stand thus:—One-third of the county is under a regular course of husbandry; one-third furze crofts, which are only broken up once in twenty-five or thirty years; one-third wholly unenclosed mountain or waste land. I am persuaded that there is, at the lowest estimation, o00,000 acres of waste land, which may be valued at 7*s.* 6*d.* per acre, and produce an annual rent of 37,500*l.* a-year, and yet leave a sufficiency of turbary for burning."

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* Carew says, that large quantities of garlic were cultivated in Stratton for exportation.

In 1808, Mr. Worgan was employed to make a general survey of the agriculture of the country. He seems to have been much struck with the advance made since the visit of Frazer, in 1794, and says that no county exhibited greater improvement. Still he makes the same remark, "that the course of crops is extremely reprehensible." "There is no circumstance which evinces the truth of this assertion more than the wretched, exhausted, foul appearance of the ground laid down with grass seeds; nor can it be otherwise after having been cropped with corn as long as it will bear any." He computes the average crops of wheat at 18, 20, and 22 Winchester bushels per statute acre, and says that in strong lands as much as 30 or 40 bushels are sometimes obtained. Barley he puts at 30 to 60 bushels, and says that the crop sometimes reaches 90 bushels. Oats 40 to 60. Potatoes from 200 to 600 Winchester bushels per acre. Of this crop he says, "If Cornwall does not grow wheat enough for its inhabitants, it supplies other countries with large quantities of potatoes. This year (1808) some shiploads have been sent to London, and Portsmouth and Plymouth are furnished with many bushels annually from hence." Frazer also speaks of the great abundance of this produce, there being sometimes as much as 900 bushels obtained from a Cornish acre in the neighbourhood of Penzance, where two crops are ripened in one season. Polwhele quotes Hals to prove that potatoes were cultivated in Cornwall as early as the time of the Normans. I am quite at a loss to understand that passage. As a proof of the advance made in the mechanical means of husbandry, Mr. Worgan says that no county affords a greater variety of wheel and other carriages than Cornwall; such as the waggon, wain, one or two-horse cart, ox butt, gurry butt, slide, and sledge. From the foregoing accounts I deduce these two inferences,—that even as late as the year 1794, the practice of exhausting the land was general; and that, on the whole, the agriculture of the county did not more than feed its own inhabitants.

As to the number of those inhabitants, we have at first but little to guide us. Carew mentions a muster-roll, but does not give its amount. He dissents from the opinion of those who thought that the numbers had of late *diminished;* but does not speak confidently of an increase. Lysons refers to a poll-tax in the time of Edward the Third (1377), and thence calculates the whole population of the county of Cornwall, making allowance for those not assessed, at 34,960 persons. Accurate and industrious as he was, I dare not dispute his authority; but Chalmers, who seems to quote the record, gives the return for Cornwall at 51,411. As, however, Lysons wrote with an especial view to Cornwall, and Chalmers, in his estimate of the wealth of England, only incidentally refers to this county, I think it safest and best to abide by Lysons. The population of all England and Wales was then, according to the same poll-tax, 2,353,203 persons. I shall presently show that, in Carew's time, the whole population of England and Wales had about doubled. It is reasonable to conclude, therefore, that the population of Cornwall had doubled also, and comprised 69,900 persons.

The estimate for England in Carew's time is arrived at by the following means:—Harrison, quoted by Hume, has given the result of a muster-roll of fighting men, taken in 1575; and Sir Walter Raleigh asserts that there was a general review in 1583 of all the men capable of bearing arms. These two accounts agree in representing the fighting men to have been about 1,172,000, and therefore are worthy of some confidence. But, as they far exceed all other computations, one of which, according to Hume, made the whole population at that time only 900,000 souls, I think it probable that the enumeration was pushed to its utmost extent, and that many a stout boy under 20 years of age, who could draw a bow, was returned as a fighting man. Their number may be taken to balance the number of old men incapable of bearing arms; and as Mr. Rickman has shown that the age of 20 divides the male population into two equal parts, and as the females are always nearly equal to the males, I multiply the supposed fighting men by four for the whole population, which I take to have been 4,688,000, or nearly double that of 1377.

The number of the people of Cornwall in 1700 is stated by Marshall (I know not how computed) to have been 105,800; and as the great increase in our population which has since occurred, probably arose, and has proceeded, *pari passu*, with the developement of the copper mines, it seems not unreasonable to suppose that, previous to the existence of the copper mines on a great scale (that is, previous to the time of Tonkin), the rate of increase was slow and inconsiderable. I venture, therefore, to take the population of 1700, namely, 105,800 persons, as a fair approximation to that of 1691 and 1733; that is to say, the date of the article in the "Philosophical Transactions," which I have quoted, and that of Tonkin's notes. The population of England and Wales, according to Mr. Finlaison's calculation, was, in 1760, 6,479,730. Assuming, therefore, that the population of Cornwall bore the same proportion to that of all England and Wales, as when the census was taken in 1801, 1811, 1821, and 1831 (that is, as 1 to 47⅓), the population of Cornwall will have been, at the time mentioned, about 137,000. Borlase's book preceded this date by only a few years, and the population may fairly be assumed to have been in Borlase's time, about 135,000 persons.

By the census of 1801, the population of Cornwall appears to have been 188,269 persons; and the census of 1811 shows that, during the intermediate ten years, the population had increased at the rate of 15 per cent. Supposing that the increase in the seven years preceding 1801 was at the same rate, the population of the county in 1794 may be assumed to have been about 171,000 persons. We are now in a condition to frame a table of the population which probably *was* fed by the agriculture of the county from 1583 to 1794, and it will stand thus:—

	Population.	Increase per Cent. of Agricultural Produce.
1583 . .	69,900	..
1691 1733 . .	105,800	51
1756 . .	135,000	28
1794 . .	171,000	26½
The whole period	. . . . . .	144

Such may be presumed to have been the progress of agriculture in Cornwall during 200 years; that is, up to the time of Frazer's Report. I can carry this comparison no further, for we are now arrived within the limits of official accuracy; and slight indications like the foregoing, which may be accepted as evidence of fact, however inconclusive with respect to remote times, are now of no value whatever to any one accustomed to rely on official documents, and the detailed returns of recent transactions, which we are in the habit of seeing made to both Houses of Parliament. Upon almost every other subject correct information may be obtained; but, for the reason I have stated, it is impossible to estimate the coasting trade in corn and flour beyond fourteen years ago. I am content, therefore, to pass on to the present time, and to inquire what information may be obtained as to the present state of the county, its products, and its population. In a few weeks we shall know accurately what are our present numbers, but I presume that we shall find it to be about 345,000. This increased and increasing population is dependent for subsistence on our agriculture and fisheries, aided, perhaps, by some small supply of corn by the coasting trade, if it should be found that the quantity of that article weighed against the export of potatoes, cattle, and other produce, turns the balance in that direction. It must be borne in mind, that since 1832 up to the middle of 1838, there had been no considerable importation of foreign corn into England generally: consequently the home trade by itself affords a true measure of the traffic in grain of Cornwall in particular. From official sources I have compiled the following Tables:—

TABLE A.—*Coasting Trade of Cornwall in Corn and Flour.*

		Quarters Imported.	Quarters Exported,
1836	Wheat	6,897	8,692
	Flour (105,228 cwts.) =	30,065	(1,612 cwts.) 460
	Barley	5,748	41,352
	Malt	3,159	7,861
	Oats	7,115	10,394
1837	Wheat	8,610	6,314
	Flour (149,099 cwts.) =	42,574	(6,088 cwts.) 1,739
	Barley	7,552	26,536
	Malt	2,544	4,388
	Oats	4,377	3.677
1838	Wheat	11,980	3,009
	Flour (128,060 cwts.) =	36,588	(3,088 cwts.) 882
	Barley	9,060	22,889
	Malt	2,916	5,482
	Oats	1,462	2,368

The trade with Ireland, not included in Table A., was as follows. There was no export from Cornwall to Ireland:—

TABLE B.—*Corn and Flour Imported from Ireland.*

		Quarters Imported.
1836	Wheat	1,027
	Flour (75,449 cwts.)	21,556
	Barley	84
	Oats	11,896
1837	Wheat	568
	Flour (50,360 cwts.)	14,388
	Barley	258
	Oats	
1838	Wheat	2,500
	Flour (82,233 cwts.)	23,495
	Barley	883
	Oats	22,220

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* The actual number, as obtained from an authentic source, is 341,317.—ED.

Some oatmeal and grits are imported annually from Ireland, but the quantity is inconsiderable.

TABLE C.

Showing the Total Imports and Exports of Grain and Flour from all places, Ireland included, and the Balance resulting:—

	Quarters Imported.	Quarters Exported.	Difference.
	Wheat and Wheat-Flour.		
1836	59,545	9,152	50,393
1837	66,140	8,153	57,987
1838	74,563	3,891	70,672
	Excess of Imports		3)179,052
	Average quarters imported		59,684
	Barley and Malt.		
1836	8,991	49,213	40,222
1837	10,354	30,924	20,570
1838	12,859	28,371	15,512
	Excess of Exports		3)76,304
	Average quarters exported		25,435
	Oats.		
1836	19,011	10,394	8,617
1837	26,127	3,677	22,450
1838	23,682	2,368	21,314
	Excess of Imports		3)52,381
	Average quarters imported		17,460

Reducing the two latter to the standard of wheat, that is, taking barley at half, and oats at one-third the value of wheat, we have the total deficiency of grain in quarters of wheat as follows:—

	Quarters.
Wheat and flour imported	59,684
Oats imported, reduced to wheat	5,820
	65,504
Deduct barley exported, reduced to wheat	12,717
	52,787

Thus, it appears that there was an annual deficiency of grain in the county to the amount of 52,786 quarters of wheat; and supposing the consumption to be the same in Cornwall as elsewhere throughout England, namely, one quarter of wheat per annum to each person, there will have been the same number of persons to be fed by importation; that is to say, rather less than one-sixth of the population at that time. Now let us see how far the balance is restored by the export of agricultural produce of other kinds raised in the county, but not used by its inhabitants:—

First, of *Potatoes.*—Of these no official account can be obtained; but from private sources I have received the following information, which I believe may be relied upon, for the year 1839. But as that year happened to be a year of less export than the preceding years, it is not fair to assume that it affords a full average. I am told, also, that in proportion as the means of transport have increased, and will probably continue to increase, the trade in potatoes may be considered as a growing trade, which is capable of immense developement. The increase of steam communication has already produced a great effect, subsequent to the transactions which I am about to relate:—

	Cwts.
In 1839 there were exported from Falmouth, during the first six weeks of the season, 600 baskets of potatoes per week, each weighing 1 cwt.	3,600
Probably, during the remainder of the season, as much as	3,600
From Hayle, during the whole season	850
From Penzance	3,040
From Looe and other parts of the county, probably	600
Total of potatoes exported	11,690

As a large portion of the above is the very early produce of Penzance and its neighbourhood, which comes into competition with the forced potatoes of the London market, the price at which it is sold is very high. Very early in the season the price of potatoes sent to London per steamer is about 2*l*. per Cornish bushel, or 1*l*. per basket. The export continues till the price falls to 10*s*. per basket, or perhaps to 7*s*. 6*d*.; but very little is sent when they fall to this latter price, so that 15*s*. may be considered the average price. Suppose that the whole quantity is sold at an average price throughout the year of 10*s*. per basket, the value will be 5,845*l*., equal to 2,050 quarters of wheat at 57*s*. I am induced to think that the above is below the fact, because one company took credit in the months of May and June, 1836, for 742*l*. 10*s*. for the transport of Cornish vegetables (including 650 baskets of potatoes of 1 cwt. each), which were shipped for London by steamers, at a freight of 2*s*. per cwt. It is clear, also, that other vegetables are shipped at Falmouth for the London market; but I have no means of computing the amount.

Next, with respect to *Cattle*.—It is quite impossible to get an accurate account of the cattle which annually cross the border to and from Devonshire. The following information is derived from two very considerable Cornish dealers, and from two Devonshire persons engaged in the same traffic, who are in the habit of attending the fairs in the county. Though they differ in the gross amount, they agree in this—that nearly five times as many beasts are driven out of the county as come into it. One account calculates the number driven out of the county at 6,000, but says, that a great many of these are small steers, worth from 7*l*. to 10*l*. each. He estimates the weight of all the cattle exported, as averaging from 5 cwts. 2 quarters to 6 cwts. per head. Another says only, that two-thirds of all the oxen bred in the county are sent upwards to be fatted, besides some cows; and that, since the breed of cattle has been so much improved in Cornwall, the number imported from the north of Devon has greatly decreased. A third computes the number of lean beasts driven out of the county to be above 3,000, and that from 1,000 to 1,500 cattle for the butcher are annually sent to Plymouth and Devonport. He values the lean beasts at 12*l.* per head, the fat cattle at 15*l.* per head. His information is derived from great experience, and from careful inspection of the lists of fairs, so that I rely with some confidence on his opinion. The fourth confirms his statement as to the number sent to Plymouth and Devonport, but says nothing of the lean cattle sent to other places. He computes the cattle sold to Cornish butchers at from 800 to 1,000. With respect to sheep and lambs, it appears that all which are reared in the county are fattened and consumed at home. On the whole, then, I am inclined to think that the following may be taken as a fair approximation to the amount and value of the traffic in cattle between this county and Devon:—

Exported.—Lean cattle, 3,500, at 10*l.* per head . . .	£35,000
Cattle for the butcher, 1,200, at 15*l.* per head	18,000
	53,000
Imported.—Cows for the butcher, 900 at 12*l.* per head .	10,800
	£42,200

This amount is to be carried to the credit of the agriculture of the county, and is equal in value to 14,807 quarters of wheat at 57*s.*

It is quite impossible to ascertain the quantity of the supplies afforded to the shipping not belonging to the county, at Falmouth, Penzance, and other ports. It is, therefore, by a mere guess that I take it at the value of 5,000 quarters of wheat. It is said, that by the packets alone, a sum of 100,000*l.* is annually expended at Falmouth, a great part of which must be for provisions consumed by those who do not belong altogether to the county. Vessels of all kinds are in the habit of taking in supplies at Falmouth, which are sometimes valuable, and would occupy a large portion of the 5,000 quarters which I take for the whole county. Then, as a set-off against the deficiency before stated, namely, 52,786 quarters of wheat, there will be—

For potatoes exported (quarters of wheat) .	2,050
For cattle ditto	14,807
For the shipping	5,000
Total exports	21,857

This amount should be deducted from 52,786 quarters of wheat, and there will remain a deficiency of 30,929 quarters. I conclude, then, that the agricultural produce of the county is insufficient for its own inhabitants, to the extent of 30,929 quarters of wheat.

Now the value of the above, at 57*s.* per quarter, is 88,147*l.*, and this sum must be annually paid out of the exports of the county to the parties supplying us with corn. These exports may be estimated as follows—they are almost entirely of minerals and fish:—

Copper ore, average of 1838 and 1839	£862,527
Ditto ditto, sold by private contract, say one-third.	71,965
Tin ditto, sold at ticketings	215,895
Lead ditto	13,680
Silver ditto	14,777
Iron ditto	16,108
Arsenic ditto (218 tons)	2,834
Granite (8,483 tons)	8,667

China clay (in 1838*) 20,784 tons China stone, 7,344 tons	35,160
Sulphur, Slate, &c.	..
Fish (pilchards)	28,385
Total exports	£1,269,998

The quantities and value of pilchards exported in 1838 were (exclusive of shipping charges)—

	£
3,182 hogsheads, at 52*s.*	8,273
4,398 ditto at 56*s.*	12,314
	20,587

In 1839—

5,959 hogsheads, at 52*s.*	15,493
6,897 ditto at 60*s.*	20,691
	36,184
Average value	£28,385

Comparing these exports with the deficiency of agricultural produce, it would appear that one-fourteenth of our annual exports is spent to procure food for the population at home.

Of wool I can say nothing, and the only method by which I can get at any knowledge of the quantity of cattle and sheep slaughtered and consumed in the county, is from the tanyards. A gentleman, to whom I have great obligations, has taken considerable pains to collect a true account of the hides and skins tanned by the various tanners throughout the county in the year 1839. The result is—

Bullocks	15,950
Calves	11,550
Sheep	56,600

Computing the carcass of each bullock at 6 cwts., each calf at 1 cwt., and each sheep at 1½ cwt., the gross amount will be 135,500 cwts., equal to about 45 lbs. for each person of a population of 336,000 souls: this is exclusive of pig-meat. The skins of pigs not coming to the tan-yards, I have no means of computing their number, but the amount is certainly great. Before I quit this subject, I will quote a quaint passage from Carew, which shows the quality of the sheep in his day, and the nature of the wool.—"The sheepe generally had little bodies and coarse fleeces, so as their wool bore no better name than Cornish hair; and, for such, hath been transported without paying custom."

Mr. Couling, who gave his evidence before the Emigration Committee in 1827, says that there were then in Cornwall—

	Acres.
Of cultivated land	550,000
Of improvable waste	190,000
Of unprofitable land	109,000

Of the improvable land, which was mere waste at that time, vast quantities have been brought under the plough; and not a year passes in which this cultivation is not extended. With a view of ascertaining the qualities of the raw material out of which these improvements have been wrought, and in the hope that such knowledge may be available for future improvements, I have had specimens of the natural soil analysed, taken from wastes on the three principal geological formations,—the killas or slate, the granite, and the serpentine. Out of these the work has been done, and the success which has attended their conversion into fertile land must have proceeded either from the addition of something wanting in their composition, or the removal of something deleterious. I subjoin an analysis of each kind of soil by Mr. Phillips, of the Museum of Economic Geology:—

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* Henwood, see Report of Royal Institution of Cornwall.

No. I.—*Killas, from Goonreath Downs,* 8 *inches deep.*

Silica	80·2
Alumina, with a trace of oxide of iron .	16·0
Vegetable matter	3·8
	100·0

No. II.—*Under the above,* 16 *inches deep.*

Silica	77·5
Alumina, with a trace of sulphate of lime	13·4
Oxide of iron	4·8
Vegetable matter	4·3
	100·0

No. III.—*Granite, from Gadlias, near Penryn.*

Silica	74·0
Alumina, with a trace of sulphate of lime	16·0
Oxide of iron	5·9
Vegetable matter	4·1
	100·0

No. IV.—*Serpentine, from Goonhely Downs, near Trevivian, St. Keverne.*

Silica	70·0
Alumina, with a trace of sulphate of lime	20·0
Oxide of iron	6·2
Vegetable matter	3·8
	100·0

The first thing which strikes us here, is the great similarity in the ingredients and the proportions in all these specimens, and the total absence of some of the characteristic components of the rocks beneath. The felspar in granite contains about 17 per cent. of potash; but there is no potash in the soil above. The serpentine contains from 30 to 40 per cent. of magnesia; but there is no magnesia in the soil of Goonhely Downs. Yet, these are indestructible substances; and if the soil had been formed by decomposition of the rocks beneath, a considerable quantity of each must have been present. Moreover, there would have been no alumina in that derived from serpentine, which contains none. These facts are so extraordinary, that I should doubt the accuracy of the analysis, were it not that Dr. Daubeny analysed the soil of Goonhely Downs a-year ago, and arrived at the same result. Hence arises this very difficult geological problem, which I am quite unable to solve, and with which I will conclude this paper. These deposits are on high ground: in the case of Goonhely Downs, extending over a very extensive and elevated plateau. Whence did they come? how formed? or how transported?